

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2006-  
FOR  
CHEMICAL WASTE MANAGEMENT, INC.  
CLASS II/III LANDFILL B-19 BIOREACTOR AND CONTROL UNIT  
CLASS II/III LANDFILL B-17  
KETTLEMAN HILLS FACILITY  
KINGS COUNTY

Compliance with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258), dated April 2000 is ordered by Waste Discharge Requirements Order No. R5-2006-\_\_\_\_\_.

**A. REQUIRED REPORTS**

<u>Report</u>	<u>Due</u>
1. Annual Monitoring Summary Report (Section E.5.)	<b>Due Annually on 1 May</b>
2. Groundwater Detection Monitoring (Section D.1)	<b>Semi-Annual</b>
3. Groundwater Constituents of Concern (Section D.1)	<b>Every 5 years<sup>1</sup></b>
4. Unsaturated Zone Constituents of Concern (Section D.2)	<b>Due Annually on 1 May</b>
5. Incoming Waste Monitoring (Section D.3)	<b>Monthly</b>
6. Leachate Collection and Removal System Monitoring (Section D.4)	<b>Monthly</b>
a. Supplemental Parameters (Section D.4)	<b>Due Annually on 1 May</b>
b. Constituents of Concern (Section D.4)	<b>Due Annually on 1 May</b>
7. Landfill B-19 Bioreactor Operation & Performance Monitoring (Section D.5)	<b>Due Annually on 1 May</b>
8. Facility Monitoring (Section D.6)	
a. Facility Inspection & Report (Section D.6.a)	<b>Annually</b>
b. Storm Event Inspection (Section D.6.b.)	<b>When required</b>
c. Seismic Event Inspection (Section D.6.c)	<b>When required</b>

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<sup>1</sup>Every 5 years, the sampling shall alternate between the 1<sup>st</sup> Semi-Annual and 2<sup>nd</sup> Semi-Annual event.

## B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in the Standard Provisions and Reporting Requirements. Reports that do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the Waste Discharge Requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. Data shall be submitted in a digital database format, such as Microsoft Access or Excel, that is acceptable to Regional Water Board staff. The data shall be annotated in a manner so that it can be clearly determined whether or not the Discharger is in compliance with the Waste Discharge Requirements.

Each monitoring report shall include a compliance evaluation summary as specified in the **Section E.3. REPORTING REQUIREMENTS** of this Monitoring and Reporting Program.

Field measurements and laboratory tests shall be reported in each monitoring report. Monthly, semi-annual, and annual monitoring reports shall be submitted to the Board in accordance with the following schedule for the calendar period in which samples were taken or observations made.

<u>Sampling Frequency</u>	<u>Reporting Frequency</u>	<u>Reporting Periods End</u>	<u>Report Date Due</u>
Monthly	Monthly	Last Day of Month	15 <sup>th</sup> day of following month
Semi-Annual	1 <sup>st</sup> Semi-Annual	30 June	28 September
	2 <sup>nd</sup> Semi-Annual	31 December	31 March
Annual	Annual	31 December <sup>1</sup>	1 May <sup>1</sup>
		30 September <sup>2</sup>	15 November <sup>2</sup>
5-Year	5-Year	30 June <sup>3</sup>	28 September <sup>3</sup>
		31 December <sup>4</sup>	31 March <sup>4</sup>

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<sup>1</sup>Annual Monitoring Summary Report  
<sup>2</sup>Annual Facility Inspection & Report  
<sup>3</sup>For 1<sup>st</sup> Semi-Annual Event  
<sup>4</sup>For 2<sup>nd</sup> Semi-Annual Event

The results of any monitoring conducted more frequently at the locations specified herein or by the waste discharge requirements shall be reported to the Regional Water Board.

## C. WATER QUALITY PROTECTION STANDARD

### 1. Water Quality Protection Standards

For each landfill, the water quality protection standard shall include: 1) the list of constituents of concern, 2) the concentration limits for each constituent of concern, and 3) the Point of Compliance and groundwater *monitoring points* specified in this program.

### 2. Constituents of Concern

Constituents of concern (COCs) are the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the landfills. The COCs listed in Table 1 are analyzed **every five years** for groundwater and **annually** for liquids, if present, in the unsaturated zone and LCRS sumps. The concentration limits for COCs apply only to groundwater samples and are not applied to other liquid samples, such as liquids collected from the pan lysimeters and LCRS sumps. The concentration limits in groundwater for COCs shall be established as follows:

- a. For any COCs with detection frequencies below 10 percent during background sampling, the concentration limit shall be the Practical Quantitation Limit (PQL) as calculated periodically by the California State Certified analytical laboratory contracted by the Discharger and consistent with the most recent edition of Manual SW-846 published by the U.S. EPA. Concentrations that lie between the PQL and the Method Detection Limit (MDL) shall be reported as traces and “J” flagged accordingly. Exceedances shall be determined using either the statistical and/or non-statistical procedures specified in this program (for VOCs) and Detection Monitoring Specification F.17. (for non-detected inorganics) of the WDRs.
- b. The concentration limits for any *detected inorganic* COCs listed in Table 1 shall be established in accordance with the statistical procedure described in the most recently approved version of the *Site-Specific Groundwater Monitoring Plan (SSGWMP)* for monitoring the Landfill B-19 Bioreactor and Control Unit and Landfill B-17.

### 3. Monitoring Parameters

Monitoring parameters are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a landfill. The groundwater detection monitoring parameters for the landfills are the VOCs listed in Table 2.

### 4. Monitoring Points

The groundwater detection monitoring wells specified in **Section D. MONITORING** of this Monitoring and Reporting Program, including any new detection monitoring wells installed for Landfill B-17, shall constitute the Points of Compliance for the groundwater quality

protection standard. The unsaturated zone pan lysimeter sumps shall be the unsaturated zone monitoring points for the landfills.

#### D. MONITORING

1. **Groundwater Detection Monitoring**--Wells K-69 and K-70 shall serve as the Point of Compliance wells for groundwater detection monitoring for the Landfill B-19 Bioreactor and Control Unit. Well K-73 shall serve as the Point of Compliance well for groundwater detection monitoring for Landfill B-17, Phase A. The well locations are shown on Attachment 2 of the WDRs. Any new detection monitoring wells installed for Phases B and C of Landfill B-17 shall serve as the Point of Compliance wells for groundwater detection monitoring for these phases.

The Discharger shall collect, preserve, and transport groundwater samples from wells in accordance with the procedures described in the most recently approved version of the *SSGWMP*. The wells shall be analyzed **semi-annually** for the VOCs contained in Table 2 by U.S. EPA Method 8260B. The wells shall also be analyzed for the supplemental hydrochemical and field parameters contained in Table 3 and reported **semi-annually**, using the analytical methods specified. The supplemental hydrochemical parameters are not subject to statistical evaluation during the semi-annual monitoring events.

The following non-statistical procedure shall be used for data evaluation and reported **semi-annually**: The presence of two VOC's above their respective method detection limit (MDL), or one VOC detected above its PQL, indicates that a release of waste from the unit may have occurred. Following an indication of a possible release from the unit, two verification retests will be conducted **within 30 days** to confirm whether a release has occurred. If the analytical results from either one of the retests or both retests indicate the presence of any of the initially detected VOC(s) and a source other than the WMU is not evident, then a release has been confirmed and the Discharger shall make the necessary notifications and submit an Amended Report of Waste Discharge for an Evaluation Monitoring Program as specified in Section 20420(j) and (k) of Title 27. If both retests come back non-detect, then the well shall remain in the groundwater detection monitoring program.

The Discharger shall determine groundwater flow rate and direction semi-annually in the water-bearing zones being monitored pursuant to this Monitoring and Reporting Program, and report the results **semi-annually**. Groundwater depths measured in Gradient Well K-72 and Detection Monitoring Well K-73 shall be used to determine the groundwater flow direction and velocity for the Lower Acila C sand for Landfill B-17 Phase A. The groundwater depths in groundwater detection monitoring wells monitoring Class I WMUs at the facility in conjunction with Detection Monitoring Wells K-69 and K-70 shall be used to determine the groundwater flow direction and velocity for Landfill B-19. The location of the wells used in making these determinations shall be provided in a map contained in the **semi-annual** Groundwater Monitoring Reports.

Groundwater monitoring data shall be submitted in the **semi-annual** Groundwater

Monitoring Reports due **as specified in Section B Reporting**. Each report shall contain, in addition to reporting requirements specified in this program, a summary of the groundwater analytical data including an electronic copy of the certified analytical reports, a summary of the laboratory quality assurance/quality control standards, field information and chain-of-custody forms, groundwater elevations, groundwater gradient and velocity calculations, gradient maps, and shall indicate that they meet the standards specified in the most recently approved version of the *SSGWMP*, especially regarding well purging, field parameter measurement and stabilization, and sampling procedures. The certified analytical results shall contain the MDL, PQL, and result, and shall appropriately flag any result lying between the PQL and the MDL.

**Every five years**, a report shall be submitted for all groundwater detection monitoring wells analyzed for the COCs contained in Table 1, utilizing the statistical and/or non-statistical data evaluation procedures cited in the most recently approved version of the *SSGWMP*. This report shall contain the same detailed information as is required in the semi-annual reports as indicated above.

The Discharger may use groundwater analytical methods other than those contained in this program provided the method has an equal or lower MDL and can detect all the required COCs and monitoring parameters.

The Discharger shall submit revisions, changes, and/or additions to the *SSGWMP*, when necessary, to reflect the current groundwater and unsaturated zone monitoring systems and sampling procedures.

## 2. Unsaturated Zone Monitoring

- a. Pan lysimeters -- The Landfill B-19 Phase IA pan lysimeter sump and Landfill B-17 pan lysimeter sumps shall serve for unsaturated zone monitoring for these units.

The Discharger shall collect, preserve, and transport unsaturated zone liquid samples from the pan lysimeter sumps in accordance with the applicable procedures contained in the most recently approved version of the *SSGWMP*. Liquids collected shall be analyzed **annually** for the COCs contained in Table 1. The analytical data shall be submitted in the **Annual Monitoring Summary Report** due on **1 May** and shall contain a summary of the analytical data including the certified analytical results, a summary of the laboratory quality assurance/quality control standards, chain-of-custody forms, and a discussion of the analytical results and any noticeable increasing or decreasing trends.

The Discharger may use analytical methods other than those contained in this program provided the method has an equal or lower MDL and can detect all the required COCs and monitoring parameters.

The Discharger shall submit revisions, changes, and/or additions to the *SSGWMP*, when necessary, to reflect the current unsaturated zone monitoring system and sampling

procedures.

### 3. Incoming Waste

The Discharger shall report in a **Monthly** Waste Monitoring Report, the quantity of designated and MSW discharged to the Landfill B-19 Bioreactor and Control Unit, and to Landfill B-17.

- a. For the discharge of designated waste to the landfills, the generator shall submit documentation and the Discharger shall verify that the waste is designated waste as defined by Water Code Section 13173. Chemical analyses, if used for verification, shall be performed as required by Water Code Section 13176 and Health and Safety Code Section 100825. Source and type of waste shall be considered in determining what analyses to run. Records shall be maintained and be adequate so that an independent auditor can verify that the waste is non-hazardous.

### 4. Leachate Collection and Removal Systems

- a. Landfill B-19 Bioreactor and Control Unit -- The primary leachate collection and removal system (LCRS) fluid level in the Phase IA cell of Landfill B-19 shall be continuously monitored and recorded with an electronic digital readout system or similar device when bioreactor operations begin. The volume of leachate generated shall be measured. For the secondary LCRS in the Phase IA cell, the fluid level shall be inspected each operating day and the volume of fluid removed shall be measured, calculated in gallons per acre per day. The systems shall be operated as indicated in the WDRs. Liquid additions to the bioreactor unit shall not cause excessive leachate generation as specified in Facility Discharge Specification B.11. of the WDRs.
- b. Landfill B-17 -- The LCRS fluid levels shall be recorded each operating day. For primary LCRSs, the average daily volume of liquid removed shall be measured. For the secondary LCRSs, the average daily volume of liquid removed shall be measured, calculated in gallons per acre per day.

The results of all LCRS monitoring shall be reported in the **Monthly** Waste Monitoring Reports, except for the annual COC event. Liquids removed from the primary bioreactor LCRS shall be analyzed **annually** for the parameters listed in Table 5. Liquids removed from any landfill LCRS (primary & secondary) shall be analyzed **annually** for the COCs listed in Table 1 of this program. The analytical results shall be submitted with the **Annual Monitoring Summary Report** due on **1 May**. All analytical results submitted shall include a summary of the analytical data including an electronic copy of the certified analytical results, a summary of the laboratory quality assurance/quality control standards, chain-of-custody forms, and a discussion of the analytical results and any increasing or decreasing trends.

### 5. Landfill B-19 Bioreactor/Control Unit Operations & Performance Monitoring

The B-19 Bioreactor and Control Unit operation and performance shall be monitored for the parameters and at the frequencies indicated in Tables 4 and 5 of this program. Appropriate mitigation measures as indicated in Table 6 of this program shall be implemented when warranted. The results of the bioreactor/control unit operation, monitoring, and any mitigation measures implemented shall be documented and submitted in an **annual report** as part of the **Annual Monitoring Summary Report**. The report shall contain a summary of the analytical data including an electronic copy of the certified analytical reports, a summary of the laboratory quality assurance/quality control standards, volumes of fluid added to the bioreactor at each infiltration gallery and each vertical injection well, temperature and pressure data at each vertical injection well, leachate volume generated and liquid levels in the primary LCRS sump, leachate temperature, volume of gas extracted from each extraction well, temperature and pressure data at each vertical gas extraction well, surveyed elevations of the waste mass in both the bioreactor and control unit, and a comparison of the bioreactor process with the “dry tomb” control unit. The data shall be submitted in the annual report and shall be presented in a tabular and graphical format that makes reviewing of the bioreactor and control unit operation and performance readily discernible.

## 6. Facility Monitoring

### a. Facility Inspection

**Annually, prior to 30 September**, the Discharger shall conduct an inspection of the landfill drainage control systems, landfill slope conditions, groundwater and unsaturated zone monitoring systems, gas collection systems, LCRS and unsaturated zone riser pipes and leachate collection tanks, bioreactor unit liquid distribution system, landfill covers, and Landfill B-19 stability berm. Any necessary repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an **annual report** describing the results of the inspection, including photographs of the problem areas before and after repairs have been made.

### b. Storm Events

The Discharger shall inspect all landfill precipitation, diversion, and drainage facilities for damage during the rainy season or **within 7 days** following a precipitation event of 1.0 or more inches in a 24-hour period measured at the facility. Necessary repairs shall be implemented as soon as practicable. The Discharger shall report any damage and subsequent repairs **within 45 days** of completion of the repairs, including photographs of the problem areas before and after repairs have been made.

### c. Seismic Events

The Discharger shall perform a full-scale facility inspection **within 24 hours** following an earthquake of Magnitude ( $M_w$ ) 5.0 or greater within 25 miles of the facility or a ( $M_w$ ) 6.0 or greater earthquake within 50 miles of the facility. The inspection shall be

performed in accordance with the facility Post-Earthquake Inspection and Response Plan and a report of the inspection shall be submitted **within 30 days** as indicated in Facility Discharge Specification B.23. of the WDRs. The Discharger shall report any repairs to damaged structures or facilities **within 45 days** of completion, including photographs of the damage before and after repairs have been made.

## **E. REPORTING REQUIREMENTS**

1. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records for equipment used in field parameter measurements, all original strip chart recordings from in-line continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the post-closure period.

Sampling and analytical data shall show the following for each sample:

- a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
  - b. Date, time, and manner of sampling;
  - c. Date and time that analyses were started, and the name of the personnel and laboratory performing each analysis;
  - d. Laboratory procedure used, including method of preserving the sample, and the reagents used;
  - e. Results of analyses, and the MDL and PQL for each analysis.
2. A transmittal letter shall accompany each monitoring report summarizing the analytical results, field observations, and any field measurements made. The letter shall indicate whether the facility is in compliance with the WDRs. As applicable to the monitoring being performed, the following items shall be discussed in the letter: (1) Either there was no detections or shall include a discussion of any indications of a release and any retesting results; (2) Anomalous analytical results and measures taken to correct the problem; (3) Damage observed to monitoring equipment, monitoring wells and piezometers, gas probes, bioreactor liquid injection and landfill gas extraction facilities, landfill containment systems and covers, storm water drainage and storage facilities, and report any repairs made; and, (4) Any discrepancies in field measurements (i.e., groundwater depths, field parameter values, measured leachate levels in the LCRSs, etc.) and what measures were taken to correct the problem.
  3. Each monitoring report shall include a compliance evaluation summary containing:



- a. For each monitoring point and background monitoring point addressed in the report, a description of:
  - 1) The time of water level measurement;
  - 2) The type of pump – or other device – used for purging and the elevation of the pump intake relative to the elevation of the filter packed interval;
  - 3) The method of purging, including the pumping rate, the equipment and methods used to monitor field parameters during purging, results of field parameter testing, and the method of disposing of the purge water.
  - 4) The type of pump – or other device – used for sampling, if different than the pump or device for purging; and,
  - 5) A statement that the sampling procedure was conducted in accordance with the approved *SSGWMP*.
- b. A map or aerial photograph showing the locations of the landfills, observation stations, and the monitoring points.
- c. For each water bearing zone, a description and graphical presentation of the gradient and direction of groundwater flow and groundwater flow rate based upon groundwater elevations obtained during the semi-annual monitoring event.
- d. Laboratory statements of results of all analyses evaluating compliance with the WDRs.
- e. An evaluation of the effectiveness of the leachate monitoring and control systems, and of the run-off/run-on control systems.
- f. A summary and certification of completion of all **Standard Observations** for the landfills and for the perimeter of the landfills. Standard observations for operating landfills shall be conducted **weekly** during the rainy season (1 October to 30 April) and **monthly** during the dry season (1 May to 30 September). Standard observations for closed landfills shall be conducted **monthly** during the rainy season (1 October to 30 April) and **quarterly** during the dry season (1 May to 30 September). The standard observations shall include:
  - (1) For the landfill and along the perimeter of the landfill:
    - a) The observation of ponded water anywhere within the landfill and estimated volume and size of affected area; and, liquid entering or leaving the landfill and estimated flow rate (show the affected areas on map);
    - b) Any odor complaints received by the facility; and,

- c) The observation of erosion and/or day-lighted refuse.
  - g. The quantity and types of wastes discharged as provided in the Monthly Waste Monitoring Reports (Reporting Section B & Monitoring Section D.3. of this program) and, keeping facility records (grid sheets) at the locations in the landfill where waste has been placed since submittal of the last report.
4. The Discharger shall report by telephone any seepage from the landfill footprint **immediately** after it is discovered. A written report shall be filed with the Regional Board **within 7 days**, containing at least the following information:
- a. A map showing the location(s) of seepage;
  - b. An estimated flow rate;
  - c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);
  - d. Verification that samples have been collected and submitted for analyzing the COCs, and an estimated date that the results will be submitted to the Regional Water Board; and,
  - e. Corrective measures for containing, and proposed measures for eliminating, the seepage.
5. The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Water Board covering the reporting period of the previous monitoring year. This report shall contain:
- a. Time-Series graphs of all monitoring parameters and COCs so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in groundwater quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
  - b. All historical monitoring data, including data for the previous year, shall be submitted in a digital format (Microsoft Access). The current format submitted by the Discharger includes the entire groundwater and leachate monitoring database, updated following each monitoring event.
  - c. A comprehensive discussion of the compliance record, and the result of any corrective action taken or planned which may be needed to bring the Discharger into full compliance with the WDRs.

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- d. A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.
- e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
- f. An evaluation of the effectiveness of the leachate monitoring/control systems including the results of the annual testing of leachate collection and removal systems required under VIII.P of the Standard Provisions and Reporting Requirements.

The Discharger shall implement the above Monitoring and Reporting Program on the effective date appearing on this program.

Ordered by: \_\_\_\_\_  
PAMELA C. CREEDON, Executive Officer

JKD:jkd

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(Date)

**TABLE 1**  
**CONSTITUENTS OF CONCERN (COCs)**

<u>Inorganic parameter</u>		<u>Method</u>	<u>Inorganic parameter</u>		<u>Method</u>
1	Aluminum	6010B	18	Magnesium	6010B
2	Antimony	6010B	19	Manganese	6010B
3	Arsenic	6010B	20	Mercury	7470A
4	Barium	6010B	21	Molybdenum	6010B
5	Beryllium	6010B	22	Nickel	6010B
6	Boron	6010B	23	Nitrogen, Nitrate	353.1
7	Cadmium	6010B	24	Potassium	6010B
8	Calcium	6010B	25	Selenium	6010B
9	Chloride	300	26	Silicon	6010B
10	Chromium	6010B	27	Silver	6010B
11	Chromium VI	218.5	28	Sodium	6010B
12	Cobalt	6010B	29	Sulfate	300
13	Copper	6010B	30	Thallium	6010B
14	Cyanide	9012	31	Tin	6010B
15	Fluoride	340.2	32	Vanadium	6010B
16	Iron	6010B	33	Zinc	6010B
17	Lead	6010B			

**TABLE 1 (Cont.)  
 CONSTITUENTS OF CONCERN (COCs)**

Organic Parameters (Method 8260B)

34	Acetone	54	p-Dichlorobenzene
35	Acetonitrile	55	Ethylbenzene
36	Acrolein	56	Ethyl methacrylate
37	Acrylonitrile	57	Hexachlorobutadiene
38	Allyl chloride	58	2-Hexanone
39	Benzene	59	Isobutyl alcohol
40	Bromochloromethane	60	Methacrylonitrile
41	Bromodichloromethane	61	Methyl bromide
42	Bromoform	62	Methyl chloride
43	Carbon disulfide	63	Methylene bromide
44	Carbon tetrachloride	64	trans-1,4-Dichloro-2-butene
45	Chlorobenzene	65	Dichlorodifluoromethane
46	Chloroethane	66	1,1-Dichloroethane
47	Chloroform	67	1,2-Dichloroethane
48	Chloroprene	68	1,1-Dichloroethylene
49	Dibromochloromethane	69	cis-1,2-Dichloroethylene
50	1,2-Dibromo-3-chloropropane	70	trans-1,2-Dichloroethylene
51	1,2-Dibromoethane	71	1,2-Dichloropropane
52	o-Dichlorobenzene	72	1,1-Dichloropropene
53	m-Dichlorobenzene	73	1,3-Dichloropropane

**TABLE 1 (Cont.)**  
**CONSTITUENTS OF CONCERN (COCs)**

Organic Parameters (Method 8260B)

74	2,2-Dichloropropane	86	1,1,2,2-Tetrachloroethane
75	cis-1,3-Dichloropropane	87	Tetrachloroethylene
76	trans-1,3-Dichloropropene	88	Toluene
77	1,4-Dioxane	89	1,2,4-Trichlorobenzene
78	Methylene chloride	90	1,1,1-Trichloroethane
79	Methyl ethyl ketone	91	1,1,2-Trichloroethane
80	Methyl iodide	92	Trichloroethylene
81	Methyl methacrylate	93	Trichlorofluoromethane
82	4-Methyl-2-pentanone	94	1,2,3-Trichloropropane
83	Propionitrile	95	Vinyl acetate
84	Styrene	96	Vinyl chloride
85	1,1,1,2-Tetrachloroethane	97	Xylene (total)

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Organic Parameters (Method 8270C)

98	Acenaphthene	103	Aniline
99	Acenaphthylene	104	Anthracene
100	Acetophenone	105	Aramite
101	2-Acetylaminofluorene	106	Benzo(a)anthracene
102	4-Aminobiphenyl	107	Benzo(b)fluoranthene

**TABLE 1 (Cont.)**  
**CONSTITUENTS OF CONCERN (COCs)**

Organic Parameters (Method 8270C)

108	Benzo(k)fluoranthene	129	Dibenz(a,h)anthracene
109	Benzo(g,h,i)perylene	130	Dibenzofuran
110	Benzo(a)pyrene	131	Di-n-butyl phthalate
111	Benzyl alcohol	132	Ethyl methanesulfonate
112	Bis(2-chloroethoxy)methane	133	Famphur
113	Bis(2-chloroethyl)ether	134	Fluoranthene
114	Bis(2-chloro-1-methylethyl)ether	135	Fluorene
115	Bis(2-ethylhexyl)phthalate	136	Hexachlorobenzene
116	4-Bromophenyl phenyl ether	137	Hexachlorocyclopentadiene
117	Butyl benzyl phthalate	138	Hexachloroethane
118	p-Chloroaniline	139	Hexachlorophene
119	Chlorobenzilate	140	Hexachloropropene
120	p-Chloro-m-cresol	141	Indeno(1,2,3-cd)pyrene
121	2-Chloroaphthalene	142	Isodrine
122	2-Chlorophenol	143	Isophorone
123	4-Chlorophenyl phenyl ether	144	Isosafrole
124	Chrysene	145	Kepone
125	m-Cresol	146	Methapyrilene
126	o-Cresol	147	3-Methylcholanthrene
127	p-Cresol	148	3,3'-Dichlorobenzidine
128	Diallate	149	2,4-Dichlorophenol

**TABLE 1 (Cont.)**  
**CONSTITUENTS OF CONCERN (COCs)**

Organic Parameters (Method 8270C)

150	2,6-Dichlorophenol	171	1-Naphthylamine
151	Diethyl phthalate	172	2-Naphthylamine
152	Dimethoate	173	o-Nitroaniline
153	p-(Dimethylamino)azobenzene	174	m-Nitroaniline
154	7-12-Dimethylbenz(a)anthracene	175	p-Nitroaniline
155	3,3'-Dimethylbenzidine	176	Nitrobenzene
156	alpha-Dimethylphenethylamine	177	o-Nitrophenol
157	2,4-Dimethylphenol	178	p-Nitrophenol
158	Dimethyl phthalate	179	4-Nitroquinoline 1-oxide
159	m-Dinitrobenzene	180	N-Nitrosodi-n-butylamine
160	4,6-Dinitro-o-cresol	181	N-Nitrosodiethylamine
161	2,4-Dinitrophenol	182	N-Nitrosodimethylamine
162	2,4-Dinitrotoluene	183	N-Nitrosodiphenylamine
163	2,6-Dinitrotoluene	184	N-Nitrosodipropylamine
164	Di-n-octyl phthalate	185	N-Nitrosomethylethylamine
165	Diphenylamine	186	N-Nitrosomorpholine
166	Disulfoton	187	N-Nitrosopiperidine
167	Methyl methanesulfonate	188	N-Nitrosopyrrolidine
168	2-Methylnaphthalene	189	5-Nitro-o-toluidine
169	Naphthalene	190	0,0-Diethyl 0-2-pyrazinyl phosphorothioate
170	1,4-Naphthoquinone	191	Pentachlorobenzene



**TABLE 1 (Cont.)**  
**CONSTITUENTS OF CONCERN (COCs)**

<u>Organic Parameters</u> (Method 8270C)			
192	Pentachloroethane	202	Pyridine
193	Pentachloronitrobenzene	203	Safrole
194	Pentachlorophenol	204	1,2,4,5-Tetrachlorobenzene
195	Phenacetin	205	2,3,4,6-Tetrachlorophenol
196	Phenanthrene	206	Tetraethyl dithiopyrophosphate
197	Phenol	207	o-Toluidine
198	p-Phenylenediamine	208	2,4,5-Trichlorophenol
199	2-Picoline	209	2,4,6-Trichlorophenol
200	Pronamide	210	0,0,0-Triethyl phosphorothioate
201	Pyrene	211	sym-Trinitrobenzene
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<u>Pesticides</u> (Method 8081A)			
		221	Dieldrin
212	Aldrin	222	Endosulfan I
213	alpha-BHC	223	Endosulfan II
214	beta-BHC	224	Endosulfan sulfate
215	delta-BHC	225	Endrin
216	gamma-BHC (Lindane)	226	Endrin aldehyde
217	Chlordane	227	Heptachlor
218	4,4'-DDD	228	Heptachlor epoxide
219	4,4'-DDE	229	Methoxychlor
220	4,4'-DDT	230	Toxaphene

**TABLE 1 (Cont.)**  
**CONSTITUENTS OF CONCERN (COCs)**

	<u>Polychlorinated biphenyls</u> (Method 8082)	235	Aroclor 1248
231	Aroclor 1016	236	Aroclor 1254
232	Aroclor 1221	237	Aroclor 1260
233	Aroclor 1232	238	Aroclor 1262
234	Aroclor 1242	239	Aroclor 1268
<hr/>			
	<u>Organophosphorus Compounds</u> (Method 8141A)		
240	Methyl parathion	242	Phorate
241	Parathion	243	Dichlorvos
<hr/>			
	<u>Chlorinate Herbicides</u> (Method 8151A)		
244	2,4-D (2,4-Dichlorophenoxyacetic acid)	246	Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
245	Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)	247	2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
<hr/>			
	<u>Carbamate &amp; Urea Pesticides</u> (Method 632)	256	Methiocarb
248	Barban	257	Methomyl
249	Carbaryl	258	Monuron
250	Carbofuran	259	Neburon
251	Chlorpropham	260	Oxamyl
252	Diuron	261	Propham
253	Fenuron	262	Propoxur
254	Fluometuron	263	Siduron
255	Linuron	264	Swep

**TABLE 2**  
**GROUNDWATER DETECTION MONITORING PARAMETERS**

<u>VOCs</u> (Method 8260B)		24	cis-1,3-Dichloropropene
1	Acetone	25	trans-1,3-Dichloropropene
2	Acrylonitrile	26	Ethylbenzene
3	Benzene	27	2-Hexanone
4	Bromochloromethane	28	Methyl bromide
5	Bromodichloromethane	29	Methyl chloride
6	Bromoform	30	Methylene bromide
7	Carbon disulfide	31	Methylene chloride
8	Carbon tetrachloride	32	Methyl ethyl ketone
9	Chlorobenzene	33	Methyl iodide
10	Chloroethane	34	4-Methyl-2-pentanone
11	Chloroform	35	Styrene
12	Dibromochloromethane	36	1,1,1,2-Tetrachloroethane
13	1,2-Dibromo-3-chloropropane (DBCP)	37	1,1,2,2-Tetrachloroethane
14	1,2-Dibromoethane	38	Tetrachloroethylene
15	o-Dichlorobenzene	39	Toluene
16	p-Dichlorobenzene	40	1,1,1-Trichloroethane
17	trans-1,4-Dichloro-2-butene	41	1,1,2-Trichloroethane
18	1,1-Dichloroethane	42	Trichloroethylene
19	1,2-Dichloroethane	43	Trichlorofluoromethane
20	1,1-Dichloroethylene	44	1,2,3-Trichloropropane
21	cis-1,2-Dichloroethylene	45	Vinyl acetate
22	trans-1,2-Dichloroethylene	46	Vinyl chloride
23	1,2-Dichloropropane	47	Xylenes

**TABLE 3**  
**SUPPLEMENTAL HYDROCHEMICAL PARAMETERS**  
**AND**  
**FIELD PARAMETERS**

<u>Hydrochemical Parameters</u>		<u>Method</u>
1	Calcium	6010B
2	Potassium	258.1
3	Magnesium	6010B
4	Sodium	6010B
5	Chloride	300
6	Bicarbonate	350.1
7	Carbonate	350.1
8	Sulfate	310.1
9	Silica	6010B
10	Total Dissolved Solids	160.1
11	Total Organic Carbon	415.1

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<u>Field Parameters*</u>		<u>Method</u>
1	pH	150.1
2	Specific Conductance	120.1
3	Temperature	---
4	Turbidity	---
5	Dissolved Oxygen	---

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\* To be measured in the field prior to sampling groundwater monitoring wells.

**TABLE 4.**  
**B-19 BIOREACTOR & CONTROL UNIT MONITORING**

Monitoring Parameter	Frequency of Testing
<b>Monitoring of Liquid Additions</b>	
Leachate Seeps	Daily <sup>3</sup> in conjunction with Bioreactor leachate injection operations
Head on liner	Daily <sup>1</sup> check fluid level in primary LCRS sump so that there is no hydraulic head on the liner system
Flow equilibrium	Daily evaluate liquid levels and alarms in all tanks, infiltration galleries, injection wells, and sumps to ensure that flow equilibrium exists in order to minimize the potential for overflow and/or head buildup
Liquid flow rate (at each injection wellhead)	Daily <sup>3</sup>
Temperature (at each injection wellhead)	Daily <sup>3</sup>
Pressure (at each injection wellhead)	Daily <sup>3</sup>
<b>Landfill Surface/Settlement</b>	
Topographic mapping	Annually per Provision I. 19 of the WDRs
Settlement Plates	Annually (Bioreactor & Control Unit)
<b>Leachate</b>	
Evaluation of Leachate Quality	Quarterly, per Table 6 of this program
VOCs & Metals + Table 6	Annually, per Section D.4. of this program
<b>Gas Monitoring</b>	
Flow rate (at the flare)	Continuous
Flow rate (at each wellhead)	Monthly
Methane/Carbon dioxide (at each well head)	Monthly
Oxygen or Nitrogen (at each wellhead)	Monthly
Pressure (at each wellhead)	Monthly
Temperature (at each wellhead)	Monthly
Methane/Carbon dioxide (at flare station)	Monthly
Aggregate Flow (Bioreactor vs. Control Unit)	Monthly
Surface Emissions Monitoring (SEM)	Quarterly <sup>2</sup>
VOCs (composite feed gas to the flare)	Annual
Hydrogen Sulfide (composite feed gas to flare)	Annual
<b>Waste</b>	
Waste Appearance	Whenever drilling or excavating into the waste mass, look for a dark, sludgy color. Results to be recorded as part of well drilling logs. (Bioreactor)

<sup>1</sup>The fluid level in the primary sump shall be continuously monitored and checked at regularly scheduled times each operating day by CWMI staff to ensure that there is no hydraulic head buildup on the primary liner system.

<sup>2</sup>SEM shall comply with Operations Specification F.2. of the WDRs.

<sup>3</sup>Each operating day.

**TABLE 5.**  
**B-19 BIOREACTOR ANNUAL LEACHATE MONITORING**

	<u>Parameters</u>	<u>Method</u>
1	Chloride	300
2	Ammonia as N	350.1
3	Total Kjeldahl Nitrogen	351.3
4	Nitrate Nitrogen	353.2
5	Sulfate	300
6	Chemical Oxygen Demand	--- <sup>1</sup>
7	BOD 5-day	--- <sup>1</sup>
8	Total Organic Carbon	--- <sup>1</sup>

<sup>1</sup> Discharger to provide a method

**TABLE 6.**  
**B-19 BIOREACTOR CONTINGENCY & MITIGATION MEASURES**

Parameter	Event	Measure
<b>Daily Operations Monitoring</b>		
Leachate Seeps	Visual observation of leachate seepage	Install injection trenches and pipe perforations at least 50 feet from landfill sideslope. If seepage occurs, relocate injection points further from the sideslope and/or reduce injection rate in the area to remove seepage problem. Excavate in the area of the seep to determine if vertical infiltration is blocked by impermeable item. Remove item and replace with material to promote vertical drainage.
<b>Landfill Surface/Settlement</b>		
Severe Localized Settlement	Excessive settlement which might cause a safety hazard	In the event localized settlement causes a safety hazard, either place additional refuse and cover with soil or place additional soil to alleviate the hazard.
<b>Leachate and Liquid Management</b>		
Head on Liner	Hydraulic head buildup is detected on primary liner	Stop liquid additions and leachate recirculation. Pump and remove leachate from the primary sump until there is no hydraulic head on the primary liner system.
Pumping Systems	Pump failure (LCRS sump, leachate tank)	Have backup pump available on-site for installation.
Injection System Flow Rate	Daily application or injection rate shows signs of system overloading (i.e., excessive seeps, backed up injection wells, etc.)	Reduce liquids in bioreactor system. First reduce leachate recirculation by removing leachate to surface impoundments for evaporation. Second, reduce external liquid additions. Closely control and monitor daily volume of liquids applied to the system until signs of overloading are removed.
Leachate pH	Leachate pH drop approaches 5.5	If pH trend approaches 5.5, control addition of liquid and high moisture content solids known to cause rapid fermentation until pH rebounds toward a neutral level (near pH $\pm$ 7.0)
<b>Gas</b>		
Methane/Carbon dioxide	Levels of Methane/Carbon dioxide drop with a corresponding increase in Oxygen or Nitrogen	Inspect landfill gas well field for excessive vacuum or leaks in the system and adjust accordingly
Oxygen/Nitrogen	Exceeds levels approved by SJVAPCD at the wellhead	Inspect landfill gas well field for excessive vacuum or leaks in the system and adjust accordingly
Temperature	Exceeds 131 degrees F at a wellhead	Investigate for possibility of a landfill fire
Pressure	Loss of negative pressure on wellhead	Inspect landfill gas well field for excessive vacuum or leaks in the system and adjust accordingly
Flow Rate	Rapid change in flow rate from one monthly evaluation	Inspect landfill gas well field for excessive vacuum or leaks in the system and adjust accordingly
<b>Air</b>		
Odor	Unusually strong odors generated from direct liquid placement at working face or in injection galleries	Adjust operations to adjust severe or objectionable odors, such as: reducing liquid additions, selectively screening out particular liquids, applying soil cover to an offending gallery or trench, and possibly abandoning an injection gallery or trench in the short term or permanently.
Surface Emissions Monitoring	Surface emissions above permit requirements	Take combination of actions, such as LFG control system adjustment and cover repairs.